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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/962,315	10/31/1997	GREGORY HOUSE	067183-0157	8707

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EXAMINER

AN, SHAWN S

ART UNIT

PAPER NUMBER

2613

DATE MAILED: 11/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. 08/962,315	Applicant(s) Gregory House
Examiner Shawn An	Art Unit 2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on Aug 22, 2002

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) Claim(s) 2, 3, and 5-18 is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 2, 3, and 5-18 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some* c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. _____.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) Notice of References Cited (PTO-892)

4) Interview Summary (PTO-413) Paper No(s). _____

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

5) Notice of Informal Patent Application (PTO-152)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____

6) Other: _____

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DETAILED ACTION

Response to Amendment

1. As per Applicant's instructions in Paper 24 as filed on 8/22/02, claims 2-3 and 5-10 have been amended, and claims 11-18 are newly added.

Claim Objections

2. Claims 2-5 and 6-10 are objected to because of the following informalities: There is no basis for the recited limitation "triangulation" process in the specification. Appropriate correction is required.

Response to Remark

3. Applicant's remarks filed 8/22/02 as Paper 24 have been considered but they are not persuasive. The Applicant presents arguments of which Auty et al or Subbarao references do not perform A) any conversion on images of the first and second cameras so that their pixel units are equal in the amount of object represented, and B) a concept of computing a distance to an object by triangulation. After careful scrutiny of Auty et al's reference, the Examiner must respectively disagree, and maintain the grounds of rejection for the reasons that follow.

Regarding argument A), the matrix equation (col. 21, lines 1-6) clearly discloses a conversion for performing scaling, translation, and perspective correction (col. 21, lines 6-10). The effect is to convert images of an object with different angles/resolution to be recognized to a normalized condition (i.e., pixel units that are equal in the amount of object represented). In other words, the process of image conversion is to make each object the same size (scaling) or equal in pixel units so that an accurate comparison can be achieved with respect to the converted images. Furthermore, the Applicant's conversion means (Fig. 1) scaling apply only to camera 4 (sampling) in order to compute image depth between the images of cameras 3 and 4.

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Regarding argument B), Examiner finds no basis/support for an explanation of the triangulation process in the specification, except Fig. 6 (Prior Art) seems to be only Figure being close to utilizing triangulation process. Furthermore, utilizing triangulation process to find depth/distance between three objects in different angles are well known in the mathematics (geometry).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2-3 and 5-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Auty et al (5,809,161) in view of Subbarao (5,193,124).

Regarding claims 2-3 and 5-10, Auty et al discloses a three-dimensional structure estimation apparatus which measures a distance to an object, comprising: a plurality of cameras (6 and 8) for producing images of the object from different viewing angles (Fig. 3) and having different resolution from each other (Col. 4, lines 48-52) and conversion means (Fig. 17) for converting at least one of the images outputted from the plurality of cameras such that pixel units of all images are equal in the amount of object represented thereby (Col. 20, lines 29-67 and Col. 21, lines 1-63). Auty et al further discloses well known concept of computing a distance to the object (Col. 7, lines 1-39; Col. 21, lines 6-10 and 59-63). However, Auty et al does not specifically disclose a depth image production section for comparing the converted images using stereo imaging to calculate a distance to the object. Subbarao discloses a depth image production section (Fig. 4) for comparing the converted images using stereo imaging (Camera 1 and Camera

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2) to calculate a distance to the object (Output). Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing a three-dimensional structure estimation apparatus as taught by Auty et al to incorporate the depth image production section as taught by Subbarao for comparing the converted images using stereo imaging as an alternative/efficient way calculate the distance to the object.

As per amended limitations, please refer to ***Response to Remark***.

Regarding claims 12, 14, 16, and 18, Auty et al discloses sampling image such that the pixel units of interpolated images represent an amount of object represented by pixel units of an image having a highest resolution (Fig. 1, 6).

Regarding claims 11, 13, 15, and 17, since Auty et al discloses sampling image such that the pixel units of interpolated images represent an amount of object represented by pixel units of an image having a highest resolution, it would have been quite obvious to choose sampling image such that the pixel units of interpolated images represent an amount of object represented by pixel units of an image having a lowest resolution just as long as pixel units of all images are equal in the amount of object represented thereby.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however,

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will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shawn An whose telephone number is (703) 305-0099.


CHRIS KELLEY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600


SSA

November 6, 2002